May 15, 2006

TO: **Washington Learns Steering Committee**

FROM: Sarah Reyneveld, Research Assistant

SUBJECT: **World Class Education in the New World Economy: International Comparisons & Programs**

Washington is its own small nation in this new world economy; and we are uniquely suited to succeed. We are innovative; we have the human capital, research institutions and the natural resources to take full advantage of the opportunities presented by global trade. I believe the role of government is to support and encourage creativity, innovation, new products, a world-class education system and smart investing…Neither government nor business can do this alone. But, government can work in partnership with our business, agricultural and educational communities to build our new communities to build our new economic engines.

- Governor Christine Gregoire -

To remain economically competitive, it is important for nations to understand how to better educate and prepare their citizens to compete in an increasingly global economy. From this premise, the following examines two key education-evaluation factors:

(1) how the United States ranks in producing educated citizens, and
(2) the programmatic steps Washington and other states are taking to better educate citizens in the language and global curriculum essential for the global marketplace.

I. Where Washington Ranks Globally: Summary of International Comparisons

International comparisons provide benchmarks to assess where countries rank in educational achievement. International comparisons are also useful to identify strategies to improve student inputs and outputs. To understand where Washington's education system ranks in a global comparison, it is necessary to examine where the state ranks in **national comparisons** both in rates of participation and achievement. A snapshot of where Washington ranks today:

- ✓ **National Assessment of Education Progress (NAEP):** WA ranks 20th[1]
- ✓ **Scholastic Aptitude Test (SAT):** WA ranks 1st[2]
- ✓ **High School Graduation**: WA ranks 28th with a 72% graduation rate[3]

[1] Average NAEP Scores (2003), Fourth and Eighth Grade Math and Reading.
[2] Measured from states in which more than 40% of students successfully complete SAT exams. Mean SAT composite verbal and math scores (2004).
[3] Public High School Graduation and College-Readiness Rates: 1991-2002 (2005), "The Manhattan Institute for Policy Research", February.

- ✓ **Participation in public 2-year**: WA ranks 5th (4.174%)[4]
- ✓ **Participation in public 4-year**: WA ranks 45th (1.849%)[5]
- ✓ **Public Undergraduate total**: WA ranks 9th (6.022%)[6]

While these measurements are not comprehensive, they help to illustrate Washington's comparative strengths and challenges. For example, while Washington ranks above the national average in achievement comparisons, the state ranks average in high school graduation rates.[7] Also, while Washington's public 2-year college participation rates are competitive, state resident participation rates at public 4-year universities rank 45th in the nation.

Participation and Graduation Rates: OECD & G8 Countries

Participation measures the percentage of students in an education system in comparison to the population. One recent study, "*Comparative Indicators of Education in the United States and Other G8 Countries: 2004*[8]," measured participation levels in the G8 countries. In addition, the Organization for Economic Co-Operation and Development (OECD) has measured graduation rates for its member countries.

A summary of the findings:

- ✓ **Early Learning**: Participation for three- to five-year olds rated lower for the United States than all but one-Canada-of the G8 countries.
- ✓ **Elementary School Participation rates**: Participation rated near universal for all G8 countries.
- ✓ **High school or "Upper Secondary" graduation rates**: The United States rates lower in upper secondary graduation rate than all the OECD countries with the exception of Luxembourg, Spain, Slovak Republic, Turkey and Mexico**.**

In the United States, 64 percent of 3-5 year olds were enrolled in **early childhood education or center based pre-primary and primary care education** in 2001. The United States enrollment rates were higher than in Canada, but lower than in five other G8 countries. In France and Italy, for example, enrollment rates exceeded 90 percent.

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[4] NCES Digest of Education Statistics (2004), "Table 198: Total fall enrollment in degree-granting institutions, by control, level of enrollment, type of institution, and state or jurisdiction: 2002", http://nces.ed.gov/programs/digest/d04/tables/dt04_198.asp; U.S. Census Bureau

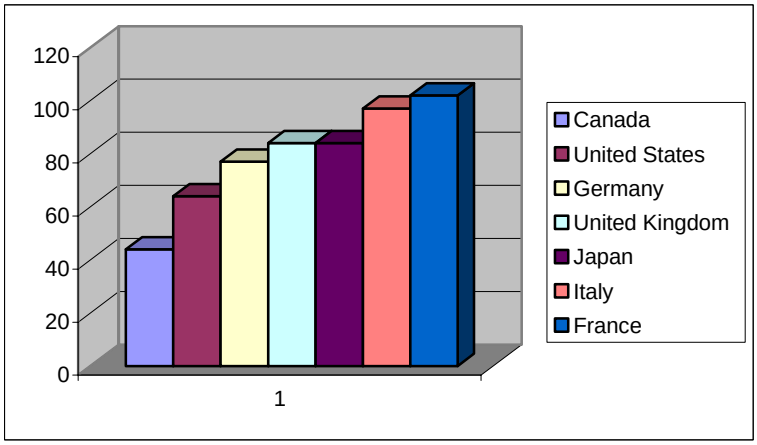
[5] Ibid

[6] Ibid

[7] Average High School Graduation is 71%. See Public High School Graduation and College-Readiness Rates: 1991-2002 (2005), "The Manhattan Institute for Policy Research", February

[8] Sen, A, Partelow, L, Miller, D and Owen, E. (2004) "Comparative Indicators of Education in the United States and Other G8 Countries: 2004", National Center for Education Statistics (NCES), http://nces.ed.gov/pubs2005/2005021.pdf

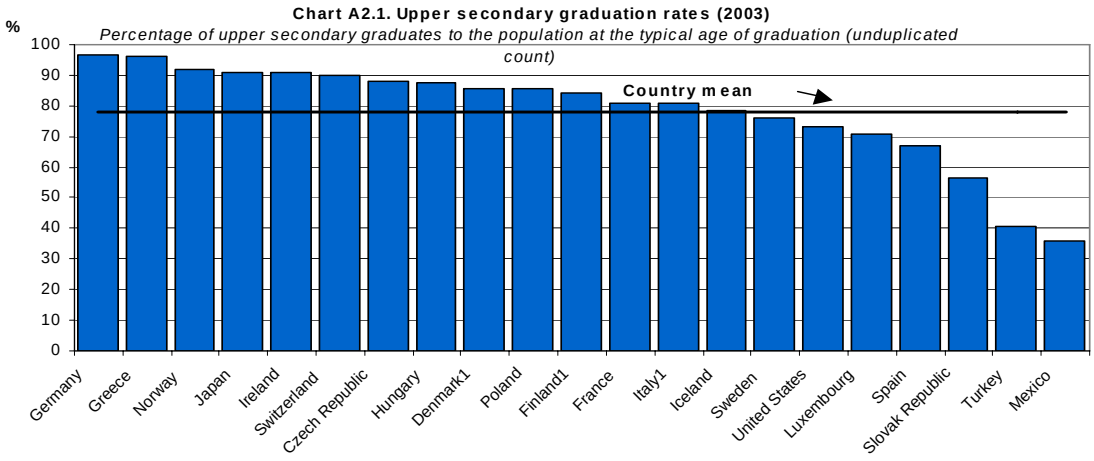
Early Learning for the G-8 Countries: Chart 1



Source: Comparative Indicators of Education in the United States and Other G8 Countries: 2004

The same study shows that **primary school enrollment rates** (ages 5-14) were near universal for all G8 countries, with the exception of the Russian Federation where enrollment rates topped 90 percent. The United States falls behind many OECD countries in **postsecondary graduation rates,** successfully graduating only 73% of postsecondary students. Countries that enjoy upper secondary graduation rates at or above 90% include Germany, Greece, Norway, Japan, Ireland and Switzerland[9] (see chart 2).

Upper Secondary Graduation Rates, 2003: Chart 2



Source: OECD

[9] OECD

Comparisons Based on Achievement

In our K-12 we are doing ok at the fourth-grade level, we are doing middle-of-the-road by eighth-grade level and in twelfth grade we were hovering near the bottom in international tests related to math.

Tracy Koon, Intel's Director of Corporate Affairs
Quoted in Thomas Freidman's book "The World Is Flat" (2005)

International assessments measure, among other categories, where nations rank in educational achievement. In 2001, the "*Progress in International Reading Literacy Study"* (PIRLS) assessed U.S 4th grade students' reading. In 2003, the "*Trends in International Mathematics and Science Study"* (TIMSS) assessed U.S. students' mathematics and science performance in the fourth and eighth grades. Also in 2003, "*OECD's Program for International Student Assessment"* (PISA) assessed fifteen year olds' mathematics performance.

- **In PIRLS and TIMSS, assessments that examine the achievement of elementary school students in reading, mathematics and science, U.S. students scored above the international average.**

In PIRLS, a study that examines reading literacy[10] among fourth grade students[11], the **U.S. scored above the international average in reading literacy**. Specifically, U.S. fourth grade students outperform their counterparts in 23 of the 34 countries, but scored lower than students in England, the Netherlands, and Sweden.[12]

In TIMSS, a study that examined the mathematics and science achievement[13] of fourth- and eighth-grade students in 46 countries[14], **U.S. fourth-grade students exceed the international averages in both mathematics and science assessments**. Specifically, U.S. fourth-grade students outperformed their peers in mathematics in 13 of

[10] The study includes a written test of reading comprehensives and a list of questionnaires aimed at factors associated with the development of reading literacy

[11] Fourth-grade students or a sample that corresponds to four years of schooling starting from the first year of International Standard Classification of Education (ISCED) Level 1, in 35 countries. Participant countries agreed to select a sample that is reflective of the target population as a whole. In 2001, the target population was the upper of the two adjacent grades with the most 9-year-olds. First, the schools were selected first and then one or two classrooms were randomly selected within each school. In the United States 3,763 students from 174 schools were sampled.

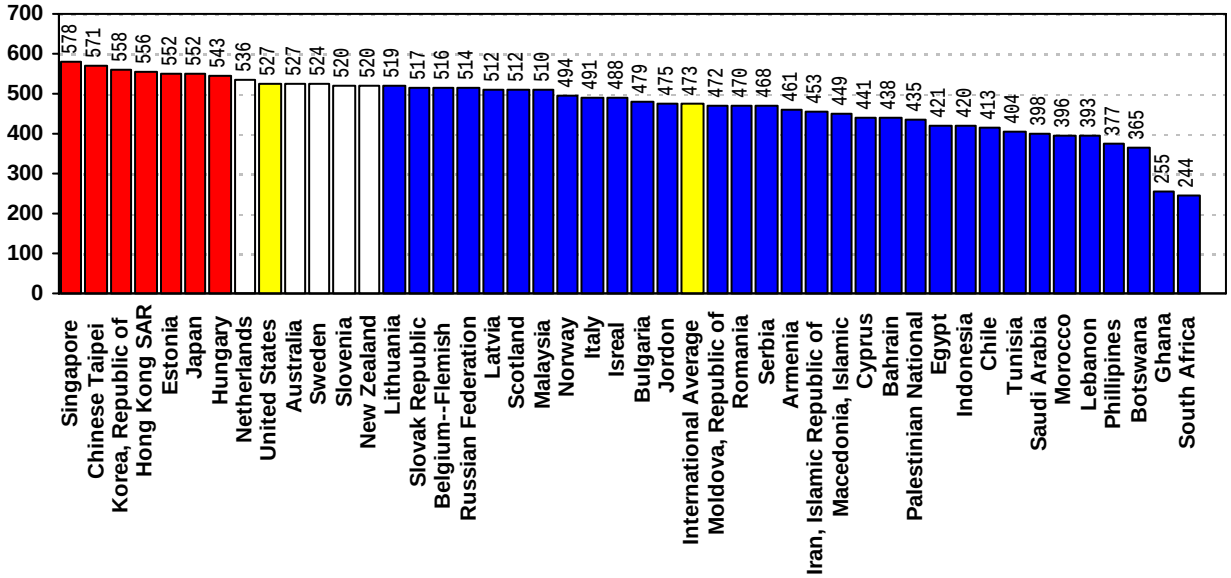
[12] International Association for the Evaluation of Educational Achievement, Progress in International Reading Literacy Study (PIRLS), 2001

[13] TIMSS collects information through mathematics and science achievement tests and questionnaires. TIMSS is based on a model that has three curricular components: 1) intended curriculum, specifically what society requires students to know about mathematics 2) implemented curriculum or how the curriculum is taught in the classroom 3) the achieved curriculum or what students have learned and their attitudes towards learning. See National Center for Education Statistics (NCES), "Trends in International Mathematics and Science Study, http://nces.ed.gov/timss/Results03.asp?Quest=3

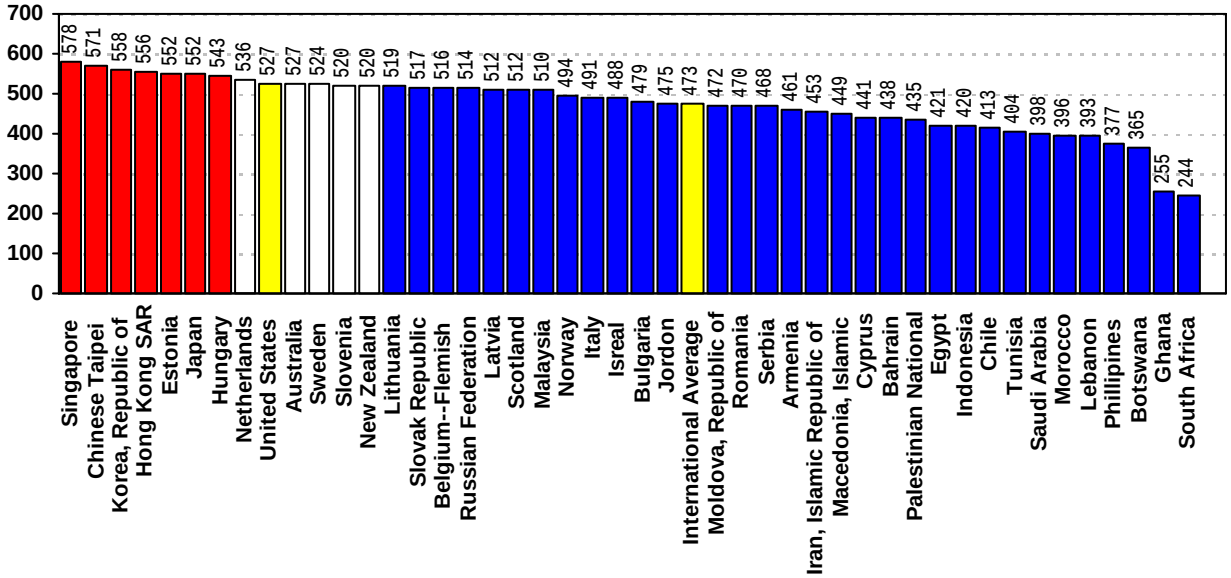
[14] Eighth-grade students were tested in 45 countries and fourth-grade students in 26 countries. All participant countries were required to draw random nationally representative samples of students and schools. From the schools that agreed to participate students were sampled from intact classes

the 24 participating countries, and in science in 16 countries of 24 countries. U.S. eighth grade students outperformed their peers in mathematics (see chart 2) in 25 countries and in science (see chart 3) in 32 countries.[15]

TIMSS Average Mathematics scale scores of eighth-grade students by country: 2003, Chart 3



TIMSS Average Science scale scores of eighth-grade students by country: 2003, Chart 4.



[15] See National Center for Education Statistics (NCES), "Trends in International Mathematics and Science Study, http://nces.ed.gov/timss/Results03.asp?Quest=3

While TIMSS and PIRLS assessed elementary school students, the ***OECD's Program for International Student Assessment (PISA)*** assessed the achievement of 15-year olds or secondary school students. While other measurements of achievement, including TIMSS and the National Assessment for Education Progress (NAEP), have a stronger link to curriculum and specific knowledge content, PISA is designed to test general "literacy" or critical thinking and problem solving skills in a particular subject area.[16]

In 2003, 41 countries participated in PISA, including all 30 OECD countries and 11 partner countries. [17]

- **In PISA 2003, U.S. 15-year old students scored, on average, below that of their counterparts in other OECD countries in both combined mathematics literacy and problem solving.**

PISA 2003 focused on "mathematics literacy," including students' aptitude to assess space and shape, change and relationship, quantity and mathematic uncertainties.[18] In this measurement, the United States scored 483, below the international average score of 500. The United Sates ranked 24th out of 29 nations in this category. [19] In a secondary measurement of problem-solving abilities U.S. students earned an average combined score of 477, below that of the combined average international score of 500 for industrialized nations. According to this score, U.S. students also rank 24th out of 29 nations.

[16] "Mathematical literacy" is defined in terms of the capacity to see how mathematics can be used in the real world. For further information see "How PISA 2003 measured student performance in mathematics", Results from PISA 2003, "Executive Summary", www.pisa.oecd.org

[17] PISA collects information from an age-based sample of 15-year olds. Each participating country selects a nationally representative sample of 15 year olds. The sample for PISA 2003 in the United States consisted of almost 4000 public and private schools from several different grade levels. For further information see "How PISA 2003 measured student performance in mathematics", Results from PISA 2003, "Executive Summary", www.pisa.oecd.org

[18] 2003 assessment included 85 different mathematic questions at varying levels of difficulty. In a given question several tasks were posed regarding a single situation described in a text or diagram. In some cases students were required to construct a response in their own words or write down calculations to explain their results. A study based on a review of mathematics and science problems from NAEP and TIMMS reports that PISA questions require multistep reasoning more often than TIMMS and NAEP. For further information see How PISA 2003 measured student performance in mathematics", Results from PISA 2003, "Executive Summary", www.pisa.oecd.org

[19] The cumulative score was based on the difficulty of the task that the student could perform in these areas. For answers that were partially correct, partial credit was rewarded. Student performance levels and the difficulty of the task are divided into six proficiency levels. The scale is constructed so that in 2003 the average student score in OECD countries equals 500 points. Approximately two-thirds of students score between 400 and 600 points (standard deviation equals 100 points).

Average Scores for PISA 2003, Chart 5

Mathematics Literacy

Country	Score
OECD average	500
Finland	544
South Korea	542
Netherlands	538
Japan	534
Canada	532
Belgium	529
Switzerland	527
New Zealand	523
Australia	524
Czech Republic	516
Iceland	515
Denmark	514
France	511
Sweden	509
Austria	506
Germany	503
Ireland	503
Slovak Republic	498
Norway	495
Luxembourg	493
Poland	490
Hungary	490
Spain	485
United States	**483**
Portugal	466
Italy	466
Greece	445
Turkey	423
Mexico	385

Problem-Solving

Country	Score
OECD average	500
South Korea	550
Finland	548
Japan	547
New Zealand	533
Australia	530
Canada	529
Belgium	525
Switzerland	521
Netherlands	520
France	519
Denmark	517
Czech Republic	516
Germany	513
Sweden	509
Austria	506
Iceland	505
Hungary	501
Ireland	498
Luxembourg	494
Slovak Republic	492
Norway	490
Poland	487
Spain	482
United States	**477**
Portugal	470
Italy	470
Greece	449
Turkey	408
Mexico	384

In summary, it would appear that while U.S. students outperform their international peers in elementary school, they fall behind the international average in high school or secondary school achievement. Two *U.S. Department of Education* press releases in 2004 following the release of the PISA and TIMSS[20] data captured this trend. The National Center for Education Statistics (NCES) report *The Condition of Education* (2005) and the Business Roundtable echoed the conclusion that U.S. students perform competitively in mathematics in elementary school, but fall behind in secondary school. The Business Roundtable went on to state in 2005 that "[a]lthough U.S. Fourth graders perform well in international competition, they fall near the

[20] The press release stated: "American's fourth and eight-grade students significantly outperform many of their international peers, scoring well above the international average in both mathematics and science, according to the latest results from the Trends in International Mathematics and Science Study (TIMSS)." U.S. Department of Education. ED (2004a). U.S. Students Show Improvement in International Mathematics and Science Assessment. Press Release of December 6th.

bottom…by 12th grade in mathematics."[21] Experts concluded that in contrast to elementary school education, weaker achievement of U.S. students was a result of weaker secondary mathematics instruction.[22]

A recent study by the American Institutes for Research entitled "*Reassessing U.S. International Mathematics Performance: New Findings from the 2003 TIMSS and PISA*"[23] sheds light on the validity of cross-comparing TIMSS and PISA data. The study starts from the premise that "many higher performing European countries that participated in PISA and contributed to the lower U.S. ranking were absent in TIMSS."[24]

The study compares a new cohort group of 12 countries that participate in both the TIMSS and PISA assessments to correct the comparison bias. The new cohort of industrialized nations includes Australia, Belgium, Hong Kong, Hungary Italy, Japan, Latvia, Netherlands, New Zealand, Norway and the Russian Federation.

Of the 12 countries in this new comparison group (chart 6):

- U.S. Mathematics scores rank 8th on fourth grade achievement and 9th on eighth grade achievement in TIMSS and 9th on PISA.
- On TIMSS fourth grade achievement the score of seven countries were statistically above the U.S. score and four were below, on TIMSS eighth grade achievement, the scores of five countries were statistically above the U.S. score and three were below and on PISA the scores of 6 countries statistically succeeded the U.S. countries and three were below.[25]

The results of this new study undermine the evidence that students in the United States are falling behind in mathematic achievement at secondary school. **It shows, rather, that the United States consistently underperforms in comparison to the top achieving cohort of countries on mathematics achievement**.

[21] Business Roundtable (2005). Tapping Americans Potential: The Education for Innovative Initiative.
[22] See Cavenagh, S and Robeten, E (2004) U.S. Students Fare Poorly in International Math Comparison", Education Week, December, 7th.
[23] Ginsburg, Allan, Cook, G, Leinward, S, Noell and Pollock, E (2005), Reassessing U.S. Mathematics Performance: New Findings for the 2003 TIMSS and PISA, American Institutes for Research, November. http://www.air.org/news/documents/TIMSS_PISA%20math%20study.pdf
[24] Ibid
[25] Ibid

Scores and Rankings of 12 Countries Participating in the 2003 International Mathematics Assessments: TIMSS Grades 4 and 8 and PISA Age 15, Chart 6

Country	TIMSS Grade 4		TIMSS Grade 8		PISA Age 15	
	Score	Rank	Score	Rank	Score	Rank
AUS	**499**	10	**505**	8	**524**	5
BEL	**551**	3	**537**	3	**529**	4
HKG	**575**	1	**586**	1	**550**	1
HUN	**529**	7	**529**	5	**490**	8
ITL	**503**	9	**484**	11	**466**	12
JPN	**565**	2	**570**	2	**534**	3
LAT	**536**	5	**508**	6	**483**	9
NLD	**540**	4	**536**	4	**538**	2
NZL	**493**	11	**494**	10	**523**	6
NOR	**451**	12	**461**	12	**495**	7
RUS	**532**	6	**508**	6	**468**	11
USA	**518**	8	**504**	9	**483**	9
AVG	**524**		**519**		**507**	
	Countries statistically above U.S: 7 Countries statistically below U.S.: 4 Difference: 3 countries statistically above		Countries statistically above U.S=5 Countries statistically below U.S=3 Difference: 2 countries		Countries statistically above U.S.=6 Countries statistically below U.S.=3 Difference=3 countries	

Country rankings are from the highest score(equals 1) to the lowest score (equals 12)

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so participation in all three results, but it is not an industrialized country and was therefore omitted.

Source: **American Institutes for Research, Mullins, Marlin, Conzalez, and Chrostowski, 2004; OECD, 2004**

II. International Programming

Twenty-five percent of college-bound high school students did not know the name of the ocean that separates the United States from Asia and 80 percent did not know that India is the world's largest democracy.

Asia in the Schools: Preparing Young Americans for Today's Interconnected World

According to the *Asia Society*, the need to integrate international programming—international education or language—into education to remain globally competitive is a relatively recent concept.[26] In addition to the demand for a globally-educated citizenry, the digital age has recently made the widespread teaching of international language and curriculum possible in U.S. schools. In response to this demand and capacity, states across the country are supporting a series of efforts to support international education including statewide conferences, task forces and commissions, coalitions, partnerships, curriculum standards and language instruction**.** Despite this movement, there is still a lack of consistent commitment to international programming at the national level. Many schools have narrowed their programming in response to state and federal accountability reforms. As a result, schools still struggle to devote time and resources to international programming.

The following is a review of current steps that Washington State and other states are taking to promote international education in key areas: **world languages, international curriculum** and **international exchanges**.

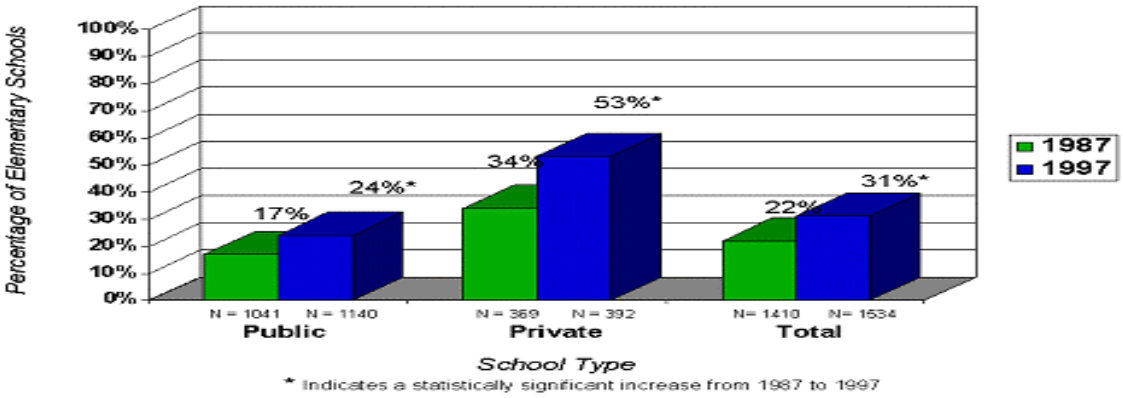
World Languages

As states become more trade dependent, international language instruction is important to ensure that citizens can effectively compete in the global marketplace and respond to global security concerns. In response, the percentage of elementary and secondary students enrolled in foreign languages is on the rise in the United States.[27] In 2000, for example, 33.8% of public secondary students in the United States were enrolled in foreign language course.[28] Some states have made large investments and some are moving towards incremental investments to ensure that more students have the opportunity for international language instruction.

[26] Asia Society (2005), States Prepare for the Global Age, pg 5
[27] Jamie B. Draper and June H. Hicks (2000), Foreign Language Enrollments in Public Secondary Schools, Fall.
[28] Ibid

Chart 7

Figure 1: **Elementary Schools** Teaching Foreign Languages (Public, Private, Total) (1987 and 1997)



For many states, the first step towards assessing language capacity is to conduct a survey. **Washington State** conducted a World Languages Survey in 2004; the preliminary results survey showed:

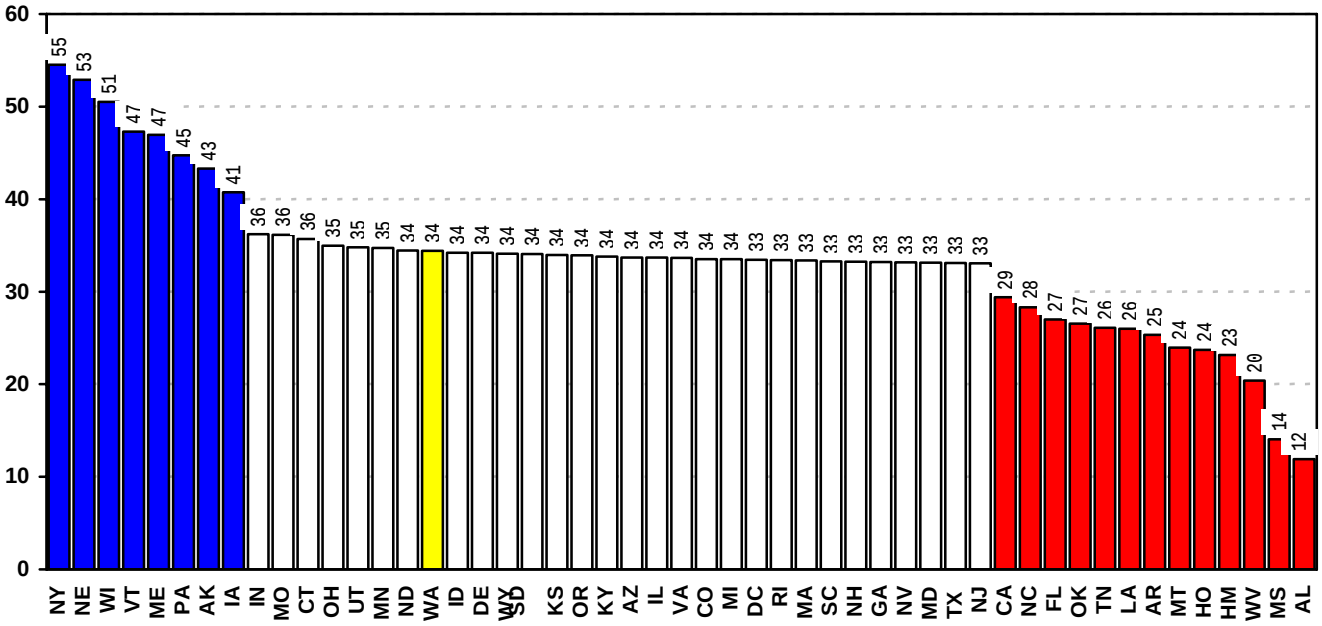
- **431 responses (19.5% of 2,212 schools)**
  --205 elementary
  --118 Middle Schools/Junior High (out of 336)
  --180 High Schools (out of 231)
- **213 schools reported NO language programs (42%)**
  --76% Elementary
  --44% Middle School
  --16% High School
- **3,867 sections offered (in approximately 431 schools)** Spanish: 56% of sections, French: 19%, German 11%, ASL: 6%, Japanese: 5%, Chinese: 1%, Latin: 1%, Russian: .06% and Arabic: 0.3%

The study's limited sample (108 of 296 districts did not respond at all) rendered it difficult to determine participation levels for Washington State as a whole.

According to the *American Council on the Teaching of Foreign Languages* 2002 study, 34.4% of Washington's public education students enrolled in foreign language courses. Comparatively, Washington is positioned in the middle; New York (54.4%), Nebraska

(52.8%), Wisconsin (50.5%), Vermont (47.3%) and Maine (46.9) are the states enjoying the highest foreign language enrollment rates.[29]

Foreign Language Enrollments in Public Secondary Schools, Fall 2000, Chart 8



Source: American Council on the Teaching of Foreign Languages

In addition to surveys, a few states are making policy investments to ensure language instruction is accessible. Two states, **Wyoming** and **New Jersey**, have mandated language instruction in schools. In 1996, New Jersey required elementary and secondary schools to offer language instruction. In 1999, Wyoming enacted a law mandating that every child in grades K-12 have the opportunity to learn another language. The Wyoming Legislature also appropriated $5 million for the 2004-2009 fiscal years to fund the development of K-6 language programs in fifty targeted elementary schools.[30]

International Curriculum

Incorporating an international curriculum is another programmatic step states have taken to ensure that students are prepared for global citizenship. Some states have successfully built international curriculum requirements into their statewide assessment standards.

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[29] Draper, J and Hicks, J. (2002) "Foreign Language Enrollments in Public Secondary Schools", American Council on the Teaching of Foreign Language", May.

[30] For further information see Asia Society (2005), "States Prepare for the Global Age", pg 9

Currently, **Washington State** does not require an international curriculum. Instead, with the approval of HB 2195 in 2004 and HB 2579 in 2006, Washington now requires schools to develop and implement a project-based assessment in social studies. Project-based or classroom based assessments (CBAs) require students to use their skills in social studies to address subjects that are internationally and locally relevant.

Several states have successfully integrated international studies into their required curriculum. An example of states that have successfully integrated global curriculum into state standards and professional development opportunities include **New York** and **Virginia.** Both states have integrated international curriculum since the 1980s: New York through a two year Global History and Geography course and Virginia through the development of international curriculum into the statewide standards. Other states, including **Delaware, South Carolina, Connecticut** and **Wisconsin** are in the process of beginning to integrate international curriculum some of which is tied to statewide assessment standards.[31]

International Exchanges

International exchanges foster opportunities for teachers and students to develop firsthand relationships with outside cultures. Such programs in **Washington State** include one-to-one teacher exchanges in Australia, Spain and Mexico. The Australia-Washington Teacher Exchange Program is a partnership with the Australian states of South Australia, New South Wales, Queensland, and Victoria run through the Social Studies/International Education in the Office of Superintendent of Public Instruction.[32] Washington also offers a one-on-one visiting teacher program with Spain & Mexico supported run through the bilingual program and a center at the University of Washington.

Governor Gregoire and Superintendent Bergeson have also expressed interest in creating a "Confucius Institute" in Washington State that would facilitate teacher and student exchanges with China. According to the *Asia Society*, **Connecticut** has established a partnership with the Chinese province of Shandong while **Oklahoma**, **Michigan**, **North Carolina** and **Kansas** are developing partnerships with other Chinese providences.[33]

[31] Asia Society (2005), "States Prepare for the Global Age", pg 11
[32] For further information see "Australian Teacher Exchange", office of the Superintendent of Public Instruction, http://www.k12.wa.us/curriculuminstruct/socstudies/InternationalEducation/Australian.aspx
[33] Asia Society (2005), "States Prepare for the Global Age", pg 11